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ABSTRACT

Nineteen junior high school teachers of English, social studies, and mathematics for low-achieving students participated in a study of the process of teacher change resulting from inservice training in effective teaching techniques. The purpose of the training was to increase student time on task and interactive instruction. Participants were divided into three groups for four weekly workshops. Group one attended only the workshops; group two attended the workshops and participated in peer observations on two occasions; group three attended the workshops and received coaching from the workshop leader on two occasions. Teacher perceptions of the recommended practices were obtained through rating of the ease and importance of using 15 teaching strategies. Research has indicated that these teacher attitudes influence teachers' decisions whether to adopt new teaching practices. Results indicate that teachers can make significant changes in their teaching behavior after only 10 hours of training, and that peer observation apears to be more effective in helping teachers change behaviors than trainer-provided coaching. Results also show that teachers' attitudes toward changes are related to their subsequent improvements in teaching behavior. Case studies are presented contrasting five non-improving teachers with five "matched" improving teachers. (JD)

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INSERVICE EDUCATION: THE PROCESS OF TEACHER CHANGE

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The spate of recent reports about the condition of American education have highlighted the need for massive upgrading of the performance of today's teachers. The study summarized here examined the process of teacher behavior change resulting from inservice training in effective teaching techniques. The findings are important not only for the improvement of teaching skills, but also for the improvement of preservice and inservice training programs seeking to affect those skills.

This research was aimed at understanding the relationships between types of inservice training activities, teacher characteristics, and teacher change in instructional practices. The training content and the organizational context were held constant in order to focus on the effects of the training itself. The objectives of the study were: (1) to describe individual teachers' teaching practices in detail before and after inservice training and to examine the changes made in their teaching habits, (2) to provide three groups of teachers with different sets of inservice training activities to test the effectiveness of the activities in producing teacher change in behavior, and (3) to measure selected teacher characteristics and to determine their relationships to individual differences in teaching behavior changes, and (4) to contrast improving teachers with non-improving teachers to gain insights into the process of change. While the results relating to the first three purposes will be described briefly here, the main focus of this paper is

on the case studies conducted on the improving and non-improving teachers.

Procedure

Nineteen junior high school teachers of English, social studies, and math for low-achieving students participated in the study. Two to five teachers were recruited from each of seven schools in the San Francisco Bay area. The schools were roughly equivalent in terms of socioeconimic status and organizational climate as indicated by teacher questionnaires.

In early October,1981, two trained coders observed all teachers teaching the same class period on three consecutive days. These data were converted into teacher behavior profiles that were given to the teachers at Workshop 1 in late October. Before the training, teachers also completed questionnaires to assess (a) selected teacher characteristics, (b) school-level organizational factors (Stallings & Mohlman, 1981), and (c) student characteristics (ability and ethnicity). Next, teachers were combined into three groups of six or seven teachers, each of which then participated in one of three variations of Stallings' Effective Use of Time Training (Stallings, et al., 1979).

The purpose of the training was to increase student time on task and interactive instruction. Four weekly workshops were

conducted after school for two and a half hours. Each of the three groups attended the workshops on different days of the week. Group I attended only the workshops; Group II attended the workshops and participated in peer observations on two occasions; and Group III attended the workshops and received coaching from the workshop leader (the principal investigator) on two occasions.

In January and February, 1982, all teachers were again observed on three consecutive days and completed questionnaires. In March, interviews were conducted and a final meeting was held to inform them of their post-training observation results.

Instruments

Teacher perceptions of the recommended practices were obtained through ratings (from one to four) of the ease and importance of using 15 teaching strategies. The "Ease" and "Importance" constructs were based on Doyle and Ponder's (1977) work that indicated that these teacher attitudes influence teachers' decisions whether to adopt a new teaching practice.

Teaching behavior was measured by the Stallings Secondary Observation Instrument (Stallings, et al., 1979). For five minutes, at five equally spaced intervals throughout the class period, the observer coded every interaction between the teacher

and students. Over the three periods of observation, approximately 900 interactions were recorded, indicating who said it, to whom it was said, what it was (question, lecture, correction, etc.), and what it was about (academics, organizing, misbehavior, or socializing). Interrater agreement was 85% or greater on all codes that were included in the final analyses.

Teacher interviews were conducted to increase understanding of the teachers' reasons for changing or not changing their behavior, to discover their attitudes toward the training, and to provide descriptive data about the process of teacher change. Other sources of qualitative data were the trainers' notes from the workshops, the observers' notes and comments, open-ended questions on the questionnaires, and teachers' unsolicited comments.

Results

Two main questions were addressed in this research: (1) Which of the three training groups improved the most, the workshops-only group (Group I), the peer observation group (Group II), or the coaching group (Group III)? and (2) How do teacher attitudes and perceptions relate to teacher improvement of teaching skills? The question of training effects will be addressed briefly before dealing with the second question in

greater detail.

Training Effects

Three teaching behavior variables were analyzed: The percent of all interactions that were about academics, the amount of class time the teacher spent alone not interacting with students, and student seatwork time. Scores were formed by averaging across the three days of observation, before which a case-by-case analysis of the stability of the teaching behaviors was conducted.

The group as a whole (n=19) improved significantly on the first two variables (t=3.01, p=.008 and t=-2.34, p=.03, respectively). Repeated measures analyses of variance revealed no significant between-group differences, possibly because of the small group sizes and the large within-group variances. Also, this approach did not take into consideration the pre-training level of teaching behavior (i.e., the amount of change that was needed). Therefore, to analyze implementation, a criterion level was set for each variable (based on previous studies by Stallings, et al., 1979 and Stallings and Mohlman, 1981). Scatterplots were then examined to determine each teacher's relationship to the criterion before and after training.

On two variables, Teacher Time Alone and Student Seatwork,

teachers showed little need for change prior to training. Consequently, the results for these two variables will not be presented here. Of the six Group-I teachers who needed to improve on Academic Interactions, three improved. All six who needed to improve in Group II reached the criterion level for this variable. And in Group III, only two of the five teachers needing improvement reached the criterion. Based on these results, it appears that the teachers participating in peer observation changed behavior more than those receiving only the workshops or coaching from the trainer.

The greater improvement of the peer observation group on Academic Interactions indicates that the addition of this training activity to workshops may be quite worthwhile. While tentative, the results also indicate that trainer-provided coaching may not be worth the cost and time required for this activity. Although Joyce and Showers (1981, 1982) have long supported the idea of coaching as a powerful inservice activity, they have not provided any guidance or data indicating which types of coaching are most helpful to teachers. The data presented here indicate that peer observation may be an especially effective inservice activity.

Because the research design was not a true experiment (with random selection and assignment of subjects), it is possible that these results occurred not because of the training "treatments", but because of other differences between the groups. Group III

differed from the other two groups in two possibly important ways: The participants were somewhat older and predominantly male. These factors may have accounted for the smaller improvements in the coaching group.

Predictors of Teacher Improvement and Case Studies of the Process of Change

Composite variables related to the Ease and Importance of using the three aforementioned teaching practices were correlated with the observed pre- and post-training use of those strategies and with degree of behavior change. The (Cronbach's alpha) reliabilities of all subscales (except the pre-training measure of the Importance of Academic Time) were greater than .80. Few significant relationships were found among the pre-training sets of variables; these measures may have lacked validity because of the teachers' pre-training lack of familiarity with the practices described on the questionnaire.

No significant relationships were found between any of the ratings of the ease of using a strategy and the observed use of it. Some teachers who improved a great deal felt the recommended practices were easy to implement; others felt the changes had come at great cost. Clearly, this seemed to be an individual matter.

There were, however, significant correlations between teachers' rated importance of the three strategies and their subsequent use of them after training. Teachers who felt that it was important to provide academic interactions tended to have a high percent of academic interactions in their classrooms (r=.68, p<.05). The rating of importance was also a significant predictor of the amount of behavior change made by the teachers (r=.73, p<.01). Similar relationships were found among the other two sets of variables. These findings support Doyle and Ponder's (1977) notion that a teacher's philosophical acceptance of a recommended practice determines whether that practice will be used. The findings do not, however support these authors' idea of cost (perceived ease) as a factor influencing implementation.

To further understand the reasons teachers have for adopting (or deciding not to adopt) new practices, "case studies" were prepared contrasing the five non-improving teachers with five "matched" improving teachers. Interview tapes, field notes, and open-ended questionnaire responses were analyzed along with all other data to create profiles of the improving teacher and the non-improving teacher. An attempt was made to match each non-improver with an improver who had a similar class and a similar pre-training score on Academic Interactions. Table 1 presents descriptive information for each pair of teachers. Detailed cases studies of each teacher are provided in Appendix A.

Table 1

Descriptions of Pairs of Non-Improvers and Improvers in Case Studies

	Non-Improvers							Improvers						
Pair Number	Teacher I.D.	Training Group	Academic Int. pre-	Academic Int. post-	Subject Taught	Grade Level	Class Ability[b]	Teacher I.D.	Training Group	Academic Int. pre-	Academic Int. post-	Subject Taught	Grade Level	Class Ability
1	11	I	52.4[a]	37.2	Remedial English	8-9	Low	71	III	57.4	74.2	Remedial English	8-9	Low
2	12	I	50.6	55.9	English	8	Average	41	II	50.0	76.6	English	7	Average
3	34	I	59.3	64.2	English	7	Average/ High	43	II	58.0	75.5	English	8	Low/ Average
4	72	III	56.2	59.1	Social Studies	7	Average	62	III	48.7	71.1	Social Studies	8	Average
5	74	III	50.5	32.9	Math	7,8,9	Low	33	I	46.8	75.0	Math	7	Low

[a] The criterion level for Academic Interactions was 70%.
[b] Class ability was rated by the teacher.

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In general, the differences between the two groups of teachers were in the areas of attitudes toward the recommended practices and feelings of self-efficacy and expectations. The improving teachers had become convinced that the practices recommended in the workshops were, indeed, important to try in their classrooms. They had experimented with several of the suggested strategies, modifying them and reflecting on their usefulness. The non-improvers failed to become convinced that the practices could, indeed, make a difference in their classrooms, and, thus, made only a few weak attempts to implement the new practices.

Another characteristic that distinguished the two groups of teachers was their sense of "teaching self-efficacy"--thier belief in their ability to make changes in their classes. The improvers had reported a growth in their sense of control over their teaching environments. They tended to report a heightened confidence in their ability to deal effectively with their classroom problems. They attributed this change in attitude to the personal, small-group-problem-solving nature of the workshops.

The non-improvers, in contrast, seemed to feel hopeless and helpless in terms of their ability to make any changes in their classes. Some of these teachers expressed low expectations of their students' ability. Others seemed to have given up, not only on their students, but also on their own ability to make

improvements in their classes. One is reminded of Good's (1981) research on the importance of high and appropriate expectations for student performance, and the dangerous self-fulfilling prophesy of low expectations.

Conclusions and Discussion

The major conclusions of this study are: (1) Teachers can make significant changes in their teaching behavior after only 10 hours of training, (2) Peer observation appears to help teachers make more significant changes than does trainer-provided coaching, and (3) Teachers' attitudes--their belief in the importance of the recommended practices and their confidence in their ability to deal effectively with classroom situations--relate to their subsequent improvements in teaching behavior.

The first finding offers hope that, in a relatively short amount of time, teachers can improve their teaching in ways that have been previously shown to increase student learning. This result is significant because of the growing need to retrain a large number of teachers (see Nation at Risk Report). The second finding is provocative because of the unexpected superiority of the peer-observation group. If this finding obtains in future studies, it may be because of the heightened sense of

collegiality and the availability of other teachers as models inherent in the peer observation activity.

Finally, the importance of teacher attitudes has been highlighted by this study. It appears that it is advisable to consider how well inservice activities convince teachers of the importance of using the recommended practices. Further, the training should provide teachers with a supportive environment where they feel safe to try new techniques and gain a greater sense of teaching self-efficacy. The small-group problem-solving format of the Effective Use of Time Training provided teachers with an instructional "support group" that may have enhanced the growth in confidence and competence among the improving teachers.

The findings from this study suggest several directions for future research. First, the area of teacher attitudes toward recommended teaching practices needs to be investigated further--Are pre-training measures of importance and ease of practices predictive of subsequent use of them? Second, the construct of self-efficacy for teaching needs to be understood--What kinds of training settings produce such feelings of confidence? Third, the peer observation activity needs to be tried with older, more "resistant" teachers and in other contexts to test its applicability and effectiveness.

A final note concerns the ultimate purpose of inservice

education--improved quality of teaching. Although the teachers in this study made considerable improvements in the number of academic interactions they provided for their students, it was observed that this change did not always include an accompanying improvement, for example, in the clarity of those interactions, or in the correctness of them. It appears that relatively high success can be attained in the training of classroom management behaviors. But the development of some of the higher cognitive aspects of teaching, such as designing lessons to assure mastery, the teaching of critical thinking skills, and dealing with differing ability levels have been more resistant to change (see Evertson, et al., 1982 and Mohlman, et al., 1982). These practices may require higher-level mental processes for their appropriate use. Understanding of the process of change in these areas is the challenge to future researchers.

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APPENDIX A

CASE STUDIES OF NON-IMPROVERS AND IMPROVERS

The Non-Improvers

Teacher 11. Teacher 11 had taught reading, English, and English as a Second Language in high school for eleven years and in junior high school for three years. She was approximately 40 years old. The majority of the 19 students in her reading class were eighth- and ninth-grade males; 11 were special education students with learning problems.

Teacher 11 was in School 1 and received the workshops-only training (Group I). A student aide from the office filled out the seating-chart observation forms for her class. The principal of this school was supportive of the training and released this teacher from extra duties as an incentive to her to participate.

This teacher spent large amounts of class time giving directions and explaining how to do each assignment. Although she was warm and patient with her students, her class pace was very slow. Generally, there were only one or two activities each period, and the students in this class were often off-task. Getting class started and transitions between activities were time-consuming. The observers rated this teacher as "average" or "fair" on effectiveness both before and after training.

In the interview, Teacher 11 reported that she had benefitted from the training. She said that, as a result of the workshops, she was providing more short activities during class; she changed the seating plan more often; and she put the daily plans and homework on the board. She reported that, for her, the easiest and most useful practices were questioning, praising and probing. She felt that she had improved in these areas. She said that she still spent too much time giving and repeating directions, but she felt "that's what the students need." She felt the hardest and least useful practice recommended in the training was reading aloud; she said it wasn't effective for her. After training, Teacher 11 rated the ease of increasing academic time about average ($z = -.24$) and the importance of increasing academic time as relatively low ($z = -1.49$).

The observer logs indicated that this teacher included more activities in her class after training than she did before training. But the amount of student-teacher academic interactions decreased to 37%. After training, this teacher still spent large amounts of time involved in organizing, management, discipline, and giving instructions. In addition, 10% of class time was spent alone without interacting with students.

Teacher 11 made many favorable comments about the training. She liked the small-group, personal sharing that

went on in the workshops. She thought the materials were "great" and shared them with other teachers. Finally, she mentioned that the training enabled her to "keep her energy level up" instead of fading out three-fourths of the way through the semester.

In summary, in spite of the fact that Teacher 11 felt she improved in some areas, her amount of teacher-student academic interaction was far below the criterion level (37.2%). This low score seemed to be due to her feeling that many of her students needed clear directions that were given slowly and repeated often. Direction-giving was not coded as an academic interaction on the observation instrument. Previous research (Stallings, et al., 1979) indicated that effective teachers had established routines for most class procedures. Thus, long, detailed explanations of directions were rarely necessary. These teachers maximized academic time by managing the beginning and end of class, and transitions, quickly and efficiently.

Teacher 11 never was able to establish such efficient routines in her class. Perhaps the presence of a high number of special education students made this impossible (although the investigator has seen highly organized and routinized special education classes). Or, the teacher's expectation that these sstudents needed such a slow pace

proved to be a self-fulfilling prophesy. Finally, the fact that Teacher 11 increased the number of class activities may have caused her to give directions more often and thus lowered her percent of academic interactions.

Teacher 12. Teacher 12 had taught a total of twelve years in secondary schools--seven years teaching English, and five years in social studies. He was approximately 40 years old. The majority of the 34 students in his eighth-grade English class were average achievers. This teacher was in School 1 and received the workshops-only training (Group I). He said he recorded the information onto the seating-chart observation form himself. Although the principal had initially offered this teacher relief from duties for the entire year as an incentive to participate, he later changed it to only a half-year. This fact may have affected this teacher's receptivity to the program.

This teacher tended to spend large amounts of time (17-21% of class time) alone at his desk doing paperwork while students did written assignments. Although he had excellent rapport with his students, there was a casual atmosphere in this class and work often stopped three or four minutes before the bell rang. One observer noted that this teacher "seemed bored." The observers rated this teacher as average to good on effectiveness both before and after training.

Teacher 12 did not seem to be particularly enthusiastic about the training. He missed one workshop and particpated little in those he attended. He did say, however, that as a result of the training, he was including a greater number of activities during the class period. He noted that this practice was the easiest and most helpful of the recommended practices. He added that it "keeps kids on the ball more." Otherwise, he said he was not doing anything differently as a result of the workshops. The main problem that he did not have much success with was that of dealing with individual student problems. He said this was because his class was too large. The hardest and least useful practices he listed were reading aloud and grouping techniques. Again, class size was the reason he said these practices did not work for him. After the training, Teacher 12 was slightly below the average on his rating of Ease of Providing Academic Time ($\bar{z}$ = -.24) and Importance of Providing Academic Time ($\bar{z}$ = -.17). Thus, this teacher's perception of the ease and importance of providing academic time was near the average of the whole group.

The observer logs indicated that, during the post-training observations, this teacher had only two or three activities per period. Before training, he had three to five activities. After training, students spent 46% of the time doing seatwork (the suggested amount was 35% or less). Perhaps this teacher just added more types of written

assignments to his daily plans and thought this was the same as "providing a variety of activities." His comments during the interview indicated that this was the case. Several seatwork assignments in a row would not be coded by the observer as a change in activity (unless there was a transition). Although there was a slight increase in Academic Interactions (from 50.6 to 55.9), the post-training level of academic interaction was still 14% below criterion. When the teacher was alone grading papers (which he did 21% of the time), this was coded "organizing" and was not considered academic interaction.

Teacher 12 missed two of the workshops. He "felt much of the material was repetitive" and that "there was nothing really new or different." He said the computer print-out on use of class time was "very useful."

In summary, Teacher 12 had a neutral attitude toward the training and did not feel that it was particularly helpful. The only practice he thought he changed was that of providing more activities each period. But, it appears that these were mostly writing activities. The rationale behind this training recommendation was that, by providing a greater variety of activities, the pace would be quicker and students would stay on task better. But, after training, Teacher 12's students were involved with written work for

45% of the class period. The teacher was alone, not interacting with students, for 21% of the time. The research by Stallings et al. (1979) indicated that teachers who spent more time alone had lower average student reading gains (r = -.40, $p \leq .01$). The same study indicated that, where students spent greater amounts of time doing written work, they learned less (r = -.41, $p \leq .01$). Clearly, the few changes made by this teacher were not likely to benefit his students' achievement. Although the training repeatedly stressed the importance of teacher-led, interactive instruction, this teacher was not willing (or able) to make such a change in his class.

Teacher 34. Teacher 34 was a reading specialist (M.A. degree) and had taught at the elementary level for five years and at the secondary level (junior high school English and social studies) for five years. She was approximately 40 years old. The 31 students in her seventh-grade reading/English class were average or above average.

This teacher was in School 3 and received the "workshops-only" training (Group I). An aide filled out the seating-chart observation form for the class. The principal of this school was supportive of the program, but delegated the recruitment and communication duties to this teacher. All teachers in this school received one college credit for participation in the workshops.

This teacher ran a business-like, fast-paced class. Typically, six or seven activities occurred during class. She had excellent rapport with her students and used humor often to create high expectations for class work. The observers rated this teacher as very effective both before and after training. One observer who had been quite impressed with this teacher made the following note during the post-training observation, "I was disappointed to see that the pace of her class has slowed down since last fall and much more time was spent on organization."

Although Teacher 34 taught "gifted" classes during the year of the study, she knew that she would be teaching remedial classes the following year and decided to participate in the workshops for this reason. She also recruited three other teachers to participate. During the interview, this teacher said she had gained much from the workshops. She said that, as a result of the workshops, she was more aware of student off-task behavior, made more positive comments, and changed her seating plan more often.

She reported that the easiest and most helpful practices were providing several activities, whole class activities, and distributing questions equally among students. The observer logs indicated that Teacher 34 was doing two of these things before the training. She felt that the provision of positive feedback was difficult for

her because it "often interferes with positive expectations." She said that she did not want to "praise for something that was expected," but that now she is more aware of the times when it is good to be "extra positive." She said her "internal mores" made it hard for her to praise students for normally compliant behavior. It appears that, for Teacher 34, this practice had little "congruence" with her preferred style (Doyle & Ponder, 1977). Her z-scores on Ease of Providing Academic Time and Importance of Providing Academic Time were .82 and -.74, respectively. She found the provision of teacher-student academic time somewhat easier but less important than the other teachers did.

The other practice she said she was having trouble with was reducing time spent on organizing (non-academic, procedural activities). In the interview, she estimated that she was spending about one-third of class time organizing either with students or without students. This was confirmed by the post-training observation data. She said the organizing time was high because "these students want more feedback"; they want to know how they are doing. In her class, one day a week was set aside to grade and return papers, discuss grades and change seats. She called this "the bookkeeping day." This teacher spent moderately large amounts of time (11.6%) alone without students. She also said that changing activities so often created more

organizing time. She added that she had found no help for these problems in the workshops.

Teacher 34 had altogether favorable comments about the workshops. She said it was personal, immediately useful, and individualized. She especially liked getting ideas and support from other teachers in such small groups. She said that she "needed these things reviewed" and that "it was like a pep talk" for next year when she gets all the "lows." She suggested that "this is the kind of thing the district should offer" to teachers.

In summary, this teacher was unable to significantly increase her academic time after the training. Her main reason for this was that she felt she needed to take class time to pass out (and grade) papers and discuss grades with students once a week. Because of the rotating schedule in this school, teachers met with each class only four times each week. This meant that students in this teacher's class spent one out of four class periods engaged mostly in bookkeeping (Academic Interactions was 40% on the one "bookkeeping day" we observed).

It is interesting to note that Stallings et al. (1978), found a correlation of $-.27$ ($p < .05$) between organizing time and reading gains. Many teachers take care of most procedural details such as paper grading and giving out

grades outside of class time. Or they only occasionally take class time out for these activities. This teacher apparently decided to have students perform many of the record-keeping tasks that most teachers do outside of class time. Perhaps because the class was "gifted," she felt they could afford to spend class time in this manner.

Teacher 72. Teacher 72 had taught seventh-grade geography for 16 years at the same school. He did not return the post-training questionnaire and was not interviewed. He failed to respond to our letters and calls regarding these data. Thus, most of the information presented here was drawn from the observer logs and the investigator's personal observations. This teacher was approximately 45 years old. The 28 students in his seventh-grade social studies class were of average ability.

Teacher 72 had a soft-spoken, almost timid style of teaching. Although he seemed to get along well with students, he lacked an assertive, businesslike manner. Although he had class rules posted, they were rarely enforced. Many students were off-task most of the period. One observer noted, "He himself seems confused about the subject manner he is presenting." There were typically three activities each period, and the pacing and transitions were slow. Several minutes were lost at the beginning of the period (passing papers, quieting down) and at the end

(students stopped work and were at the door waiting to leave two or three minutes before the bell rang). The observers rated this teacher as "poor" both before and after training.

This teacher was in School 7 and received coaching from the investigator on two occasions (Group III). After the trainer's seating-chart observation, she recommended that he increase the pace, change activities more often, and be firmer with discipline. At the second coaching observation, it appeared that he had made some progress in these areas. But the post-training observer comments and observation data indicated that there were still serious discipline problems, much off-task behavior, and relatively low rates of academic interaction (59%) in this class.

This teacher was positive about the workshops. He He came to and participated in all the sessions, and he was receptive to the coaching. His pre-training rating (z-score) of Ease of Providing Academic Time was -1.08; his z-score for Importance of Providing Academic Time was 1.5. Thus, before training (the only data we have) and compared with the other teachers, Teacher 72 felt it was quite difficult, but very important, to increase academic time.

Without the interview or questionnaire data, it is difficult to say why this teacher was unable to increase his academic time. At the final workshop, he told the trainer

that he was waiting until the beginning of the year to implement the recommended changes. The discipline problems and slow-paced transitions seemed to be the biggest barriers to increasing academic time in this class. Teacher 72's mild-mannered personality and rather vague, slow teaching style seemed to be difficult to change. He seemed to have "given up."

Teacher 74. Teacher 74 had taught secondary-level math for six years and social studies for twelve years. He was approximately 40 years old. The class he selected for the study was a math lab for all students deficient in whole number operations. Students were placed in the class when they were diagnosed as lacking whole number skills. They left the class when they passed a criterion test. The class was totally individualized, and students moved into and out of the class throughout the semester.

Teacher 74 was in School 7 and was in the workshops-plus-coaching group (Group III). He received reinforcement and suggestions for change from the trainer on two occasions. He missed one of the five workshops and challenged the training recommendations on two or three occasions during the workshops. When the trainer observed him, it was clear that he was not willing to make any significant changes in his class.

He did say, however, that he appreciated receiving the information.

On a typical day, Teacher 74 sat at his desk and helped students as they came to him (or, he asked them to come up). He would answer their questions, grade their papers, and give them more materials to work on. Aside from the interaction with the teacher, students worked individually at their seats all period.

In the fall, Teacher 74 was warm, encouraging, and supportive of his students' efforts to pass the tests and return to their regular math classes. Students worked busily at their desks most of the period; there was little off-task behavior. The teacher spent 25% of the time alone not interacting with or observing students. The observers rated him as warm and fairly effective.

At the post-training observations, however, things had changed considerably. The observers noted that there was a very negative feeling in the class. Only a few students received praise and encouragement, and others received criticism. Fewer students were on-task, and some students refused to work. Two or three students left before the bell rang. The teacher spent 12% of the time alone, and Academic Interactions had dropped to 33%. The observers rated this teacher as poor or ineffective.

In the interview, Teacher 74 said that he was not doing anything differently as a result of the workshops. He said that because his class was "designed for entry and exit," many of the practices recommended at the workshops were "not applicable." Research does not support this view (e.g., Good & Grouws, 1981). He also said that he knew about most of the strategies before the training. He did not agree with the recommendation to limit the time spent on seatwork. He said his students can work productively for 45 minutes. (Student time spent in non-interactive instruction was 69% in the fall and 56% in the winter.)

This teacher described his approach as "student-centered" with "an emphasis on curriculum." He said he was "there, basically, as a guide." His goal was for students to master the content and "learn to handle themselves independently." Since he felt most of his students "lacked maturity," he felt his was an important "transferable skill" to teach them. He said he wanted his students to learn to take "self-responsibility" and not to be dependent on outside sources for rewards. He perceived some of the recommended disciplinary strategies as "behavior modification" techniques. He said he preferred a "cognitive thinking" approach; he didn't believe in using external rewards and incentives.

Teacher 74 listed the most difficult and least helpful practice as grouping; he indicated that it was not effective in his class with the constantly changing students. He said the easiest practice was praise, because it was "common practice." After training, Teacher 74 gave a rating of "3" "easy to do" to every practice on the Ease scale of the Teaching Practices Questionnaire. His z-score for Ease of Providing Academic Time was -.24, about average for the group. His rating of Importance of Providing Academic Time was, however, the lowest in the group, $z = -2.43$. Apparently, he did not find many of the practices to be important.

This teacher felt the workshops were "interesting," but that they were too repetitious to be used with experienced teachers. He said he enjoyed seeing his observation data, but that it would have been more accurate and useful if the system had included qualitative dimensions, for example, teachers' comments and student work. He added that the training would be most helpful to other teachers if the practices were presented as a "battery of approaches" to pick and choose from. If it was used as a "rigid template to fit into," then it would not be helpful.

In summary, it appears that Teacher 74 made few favorable changes in his teaching style as a result of the training. One reason for this could have been the changing

group of students. He told us that, as the semester progresses, the students who were able to pass the test left, but those who could not pass, stayed. Thus, by the end of the semester, he was left mostly with students who had a "low probability of passing." The deterioration of class climate may have been due to the hopelessness of the situation and the boring routine of continuous seatwork. Research on math instruction by Good, Grouws (1981) indicates that low-achieving students especially need active, teacher-led instruction to succeed. These students received little teacher-led instruction; the materials were their "teachers."

It is clear from the interview with this teacher that he did not believe in teacher-led, large-group teaching. He perceived such methods as "behavioristic" and preferred a "student-centered" approach that emphasized internal motivation and rewards. It appears that he had a fairly strong philosophical objection to the recommended teaching practices. Thus, the techniques discussed in the workshops lacked congruence with his mode of teaching.

Characteristics of Non-Improvers. The greatest similarity among the non-improvers was in their post-training ratings of Importance of Providing Academic Time. Four of the five teachers were below the sample average on this rating of the importance of providing academic time.

The fifth teacher did not complete the post-training questionnaire and had no post-training data on this variable. It appears that these teachers failed to become convinced of the importance of making these recommended changes in their classes. Teacher 74 expressed a philosophical objection to what he called the "behaviorist philosophy of the training. Teacher 34 had her class routines, i.e., the "bookkeeping day," set and was not willing to change her way of conducting class. Teacher 11 did not believe in providing a quicker pace and making stronger academic demands of her low ability students. Teacher 12 was unwilling to give up his routine of grading papers during the extended periods of seatwork. And Teacher 72 decided it was too late in the semester to try anything new.

All these reasons for lack of change reflect a conflict between the teacher's preferred mode of teaching (a philosophical belief that his or her way of teaching was effective) and the practices recommended as effective in the training. Where there was a conflict, these teachers defended their preferred teaching style by pointing out that they either didn't believe in the efficacy of the changes, that the changes would not be good for students, or that they were simply unwilling to make a change at that time. When they failed to find "congruence" (Doyle & Ponder, 1977) between their style and the recommended practices,

these teachers were not able (or willing) to open themselves up to making any significant changes in their teaching. This resistance to change was apparent in the interviews, where these teachers typically reported having changed only a few relatively minor things in their classes (e.g., number of activities, seating plan, or praise).

Two of the teachers expressed low expectations of their students' abilities to succeed in their classes. Teacher 12 felt that, because some of her students were in special education programs, they were unable to follow directions or engage in "typical" academic activities. Teacher 74 indicated that the students who were still in his class at the end of the semester were "the hopeless cases." For both teachers, these lowered expectations for success may have accounted for the decisions not to try alternative teaching strategies. The review by Cooper and Good (1983) of the research on teacher expectations indicated that effective teachers expect their students to learn and do not give up until they do. It appeared that these teachers had "given up." They may have given up not only on their students but also on their own ability to help students learn. Thus, a low self-expectation may have been related to the lack of improvement of these teachers.

The Improvers

Teacher 71. Teacher 71 had taught in elementary schools for six years and in junior high schools (music, English, and social studies) for fourteen years. She was approximately 50 years old. The 21 eighth- and ninth-grade students in her reading/English class were below average in ability. About one-third of the students in her class were Mexican-Americans and spoke English poorly (or not at all).

Teacher 71 was in School 7 and participated in the workshops-plus-coaching training group (Group III). She was observed by the trainer and given reinforcement and suggestions for improving instruction on two occasions. The trainer suggested that she keep students busy until the end of the period and reduce the time spent on organizing activities. She was also encouraged to use an incentive system to reduce student call-outs during oral work. The second coaching visit revealed that many improvements had been made. At that time, additional suggestions were made for providing extra activities for students who finish early.

Before training, this teacher had serious problems with classroom control. Many students came to class late (it was first period) or without materials. The teacher took a long time to get class started and did not seem to

be well-prepared. She was interrupted often and had to discipline several students throughout the class period. The average percent of academic interactions in the class was 57. There were typically three or four activities during the period, but transitions between activities were slow and disorganized. During question-answer sessions, many students called out answers before being called on. In general, student on-task behavior was rated as "poor." One observer described this teacher as having a warm personality but showing no patience ("kind of gruff") with others. Another noted that "She acted as if she hadn't been enforcing rules much before today."

After training, about 74% of the interactions in this class were about academic subject matter. The teacher had adopted a group incentive system that seemed to have improved the students' on-task behavior (observers rated on-task behavior as "good"). The teacher still made occasional negative behavior corrections; one observer referred to them as "demands and threats." And the students still seemed to be rather unmotivated (some were "rowdy" and "belligerant"). Transitions between activities were rated as fairly quick. There were few call-outs during question-answer activities; students waited to be called on. One observer noted, "This teacher has become more effective since the fall." Another rated her as "warm and efficient."

During the interview, Teacher 71 described several things that she had changed because of the training. She had adopted an incentive system that she learned from another teacher in her group, she had decreased her "startup" time to two or three minutes (by planning for each activity and preparing ahead of time), and she provided more interactive academic activities (more oral work). She said she had increased oral participation by getting around to all students ("searching out those who don't volunteer"), and that she had found extra activities to "keep kids busy at the end of the period." She also felt she had improved her monitoring during seatwork by keeping her eyes roving around class and by keeping individual interactions short (by giving a quick "prompt").

Teacher 71 felt that the most helpful of the suggested techniques were "getting kids on-task sooner at the beginning of the period, having an incentive system, and providing equal opportunities for response." The hardest practice for this teacher was arranging seating to keep the problem students near her, but to keep the potentially violent students alone at tables to avoid inter-ethnic fights (one of these occurred during one of the fall observations). After training, this teacher rated the ease and importance of providing academic time very high ($\bar{x}$ (Ease of Providing Academic Time) = 1.87; $\bar{x}$ (Importance of

Providing Academic Time) = 1.15). These were the highest scores in the sample for each of these variables.

Teacher 71 made many favorable comments about the workshops. She said that she had "never had anything this well set-up before." She liked the "consistent, helpful guidance and advice and the chance to talk freely about problems and ways to solve them."

She felt that the observations were positive and professional. She said her previous supervisors' observations had been judgemental; they had stayed briefly and suggested that she "try to get the students to do something different." She added that the Effective-Use-of-Time observations "were teacher-oriented--how we can organize and get things better." She said that often "you know there's a problem, but you don't know what to do about it. There are so many things you think you have no control over. The training helps you see that there are certain things you do have control over and can do something about." She concluded that "the program was great, very helpful."

In summary, it appears that, in spite of having a difficult group of students, Teacher 71 made significant improvements in her classroom management skills. Her comments and high rating of Ease of Providing Academic Time indicated that this teacher experienced a greater sense of

self-efficacy--the ability to exert control over her self and her environment--as a result of this training experience. This enhanced sense of competency and control may have accounted for the improvements this teacher made in her class.

Teacher 41. Teacher 41 had taught art for fifteen years and English and social studies for two years. She was recently re-assigned from a position teaching art to one teaching English. She was approximately 40 years old. The 30 seventh-grade students in her English class were about average in ability.

This teacher was in Training Group II and engaged in peer observations. She was in School 4 and received inservice credit for participating in the workshops. She noted that the peer observations were very interesting and helpful. She said her peer observer "had lots of good tips" and added that, as a result of the observations, she moves around more and keeps track of who has been called on.

During the pre-training observations, this teacher had trouble keeping her students on-task. Just 50% of class time was spent on teacher-student academic interaction. She reprimanded students for misbehavior throughout the period. There were usually three or four activities each period. The students in this class were especially off-task during

written work. Teacher 41 seemed to have an excellent, warm manner with most of her students. One observer noted, "Her rapport with her students is hampered by the tensions that arise over disciplinary matters." Another observer wrote, "She's really business-like, but there's a sense of her being afraid of/frazzled by kids." This teacher was rated as fairly effective by the observers.

After training, the percent of academic interactions had increased to 77%. The teacher had set up a consistently-enforced discipline and incentive system, and there was much less off-task behavior. She had increased the number of activities to six per period. The observers rated her as an effective teacher.

During the interview, this teacher said that, as a result of the workshops, she instituted a "positive reinforcement motivational technique." She told her students that the purpose of the study was "to improve teaching and keep them on task." She used a stopwatch to keep track of the time spent getting class started and making transitions. She gave students stars and rewards for doing these things well. She also used a tape recorder so they could hear how noisy they were. She said that she constantly moved around the room, she distributed response opportunities more equally, and she gave more immediate feedback and reinforcement. She also mentioned that she had

"gotten rid of two or three students who did not respond to her system."

When asked to list the easiest and most helpful practices from the workshops, Teacher 41 listed: getting around to all students; the stopwatch technique for staying on-task; and rewards and competition for smooth and fast transitions. The most difficult practice for her was "keeping students aware of daily progress" and "continual reward of expected behavior from good students." The least helpful strategies were changing the seating arrangement (because of room size) and giving a whole-class incentive rather than individual incentives ("individual is more effective and quicker"). This teacher's post-training z-scores on Ease of Providing Academic Time and Importance of Providing Academic Time were -1.29 and -.17, respectively. Teacher 41 thought providing academic time was harder than all but two other teachers thought it was; but she was near the group average in her perception of the importance of providing academic time.

Teacher 41 made several positive comments about the workshops. She liked "sharing ideas with other teachers" and solving problems together. She said one of the best things about the training was learning "techniques to use in the classroom, and having time to try them out without pressure or evaluation." She added that the

observations "make you more aware of the total picture--you can't see everything while you're teaching." She described herself as "a very self-evaluative person," saying, "I acknowledge a problem and am willing to do something about it." She said she would recommend the program "very highly" to other teachers and that it was "really terrific."

In summary, Teacher 41 was highly motivated to improve. She felt that the workshops and peer observations had enabled her to be more aware of her students' behavior and to make significant changes that had increased the amount of academic time in her class.

Teacher 43. Teacher 43 had taught junior high school history and English for 17 years. She was approximately 45 years old. The 29 students in her eighth-grade class were average and below-average in ability. Eleven of them had learning disabilities.

Teacher 43 was in Training Group II, the workshops-plus-peer-observation group. She was in School 4 and received inservice credit for participation. She thought the peer observation was "excellent; it makes everyone feel more comfortable with each other." She also noted that the peer observation had made her more aware of how she was distributing her questions in class.

Before the workshops, Teacher 43 had poor class control. Students were off-task much of the time and transitions were slow. Less than 60% of the class time was spent on academic subject matter. She usually had four or five activities per period. When students misbehaved, she would put their names on the board, but there did not seem to be any penalty for misbehavior. One observer noted that she was "warm, but not very supportive" towards students. Another rated her rapport with students as "average." All observers rated her as a fairly poor teacher.

After training, this teacher increased the percent of academic interactions to 76 and students spent more time on-task. The teacher had adopted a discipline system which greatly reduced misbehavior. Also, some of the problem students had been transferred. There were approximately five or six activities each period, and the transitions were rated as about average--not very fast or slow. The observers rated this teacher average in effectiveness; they noted that she still needed to be better organized and to enforce discipline more consistently.

Teacher 43 reported that she had made severaal changes in her class as a result of the training. She said she changed her seating arrangement to a circular format, she got around to more students during seatwork, she had students read aloud more often, and she distributed response

opportunities more equally during question-and-answer sessions. As a result of these changes, she said, the students seemed more eager to participate. She listed the same techniques as the easiest and most useful of the recommended practices. She also said she kept track of the class's time off-task and had the students "make up" that time by staying in during recess.

Teacher 43 found the following practices the most difficult to adopt: keeping interactions shorter during seatwork (especially for students with severe emotional problems), avoiding emotional overreactions to misbehavior, and making it to the summary or closure of the lesson by the end of the period. She also said she had not made much improvement in giving clear, concise directions. After training, this teacher's z-scores on Ease of Providing Academic Time and Importance of Providing Academic Time were .03 and .77, respectively. Thus, she rated the ease of providing academic time about average but rated its importance quite high.

Teacher 43 reacted favorably to the training she received. She said it was more individualized and personalized than most inservice workshops she had experienced. She was especially positive about the group sharing and problem-solving: "I think people grow more with

the sharing than they do with the 'Here I am, pour it in' (purely input) approaches."

In summary, Teacher 43 enjoyed the workshops and peer observations and was able to make changes in her teaching that helped her increase the teacher-student academic time in her class. The qualitative data indicated that she still needed to make improvements in other areas of teaching (e.g., planning).

Teacher 62. Teacher 62 had taught English and social studies in junior high schools for 17 years. He was approximately 45 years old. The 30 eighth-grade students in his U.S. history class were of average ability.

This teacher was in School 6. He was in Training Group III and received the workshops-plus-coaching training. He was visited by the trainer on two occasions. At the first coaching observation, the trainer reinforced positive aspects of his teaching and suggested that he speed things up during the beginning of the period and transitions. He was also encouraged to include one more activity and was given some ideas on how to do that. Finally, he was given suggestions for implementing an incentive system. At the second coaching observation, the trainer noted that the teacher had improved in all areas.

This teacher had an unusual set of pre-training observation data. The percent of academic interactions dropped steeply (from 70% to 25%) from the first to the third day of observation (the average was 49%). The students in this class stayed on-task fairly well. There were three or fewer activities each period and transitions were rated as slow. A system of rules was posted, but the rules did not seem to be enforced. It usually took this teacher several minutes (five or more) to get the class started on an academic activity. He spent 10% of class time alone, organizing materials. One observer described this teacher as warm; another described him as "wavering between passive waiting, semi-harsh overreactions to misbehavior, and wry humor and warmth (mercurial)." Another noted that he "was not too businesslike." The observers rated him as "fair" in effectiveness.

After training, this teacher's students were somewhat somewhat off-task during seatwork activities, but the percent of academic interactions had risen to 71% (with little variation between the three academic days). He was using an incentive system to get students' cooperation. He had increased the number of activities to four or more each class period and transitions were somewhat better--about average in length. The teacher spent much less time alone organizing (5%). One observer described his style as "bumbling." The observer still rated him as fairly poor in

effectiveness. It is puzzling that there was such an improvement on the quantitative measure, Academic Interactions, but little improvement in the ratings and reports from the observers.

During the interview, Teacher 62 said that the training had enabled him to make some big changes in his teaching. He said that, before this program, he had "never thought about his style much." He added, "I just lived from class-to-class. I knew things weren't how I wanted them to be, but I didn't know why. I hadn't analyzed myself." He said that at first "it was a real blow to realize what effective teachers did and how far off I was on certain things." He added, "It helped that they told us to pick only two or three things to work on; so I picked the worst ones." He said that, as a result of the training, he had adopted a class incentive system that another teacher shared with him at the workshops. He also put the day's agenda on the board, provided a greater variety of activities, got class started more quickly, and monitored student seatwork so that he got around to each student two times a period.

He felt that one of the most helpful practices was the incentive system. Each day he gave the entire class points if they obeyed his rules. If the class had earned enough points by the end of the week, they got to play a teacher-led academic game. He felt that this technique,

along with offering more activities, improved his students' classroom behavior greatly. He reported that the least helpful practices were "providing equal opportunities for response and probing after a wrong answer." He said they were not useful because of "impatience or fear of embarrassment to the student." This teacher said that making transitions and ending class efficiently were still difficult for him. His post-training z-scores for Ease of Providing Academic Time and Importance of Providing Academic Time were -1.29 and .96, respectively. He perceived the provision of academic time as more difficult than all but two other teachers did. He saw it as more important than most of the other teachers did.

Teacher 62 said that the workshop activities were useful for getting good techniques from others, but that he "learned the most" from the coaching by the trainer. He said the workshops were "very therapeutic" and that it was nice to know "you're not alone with your problems; they're not unique." He felt that the best part was that the training was unconnected to school administration or evaluation and that it was "totally non-threatening." He said the training was "really great" and that he would recommend it for most teachers.

In summary, the changes made by Teacher 62 seemed to enable him to increase the level of teacher-student academic

time (Academic Interactions) in his class. But there was still too much off-task student behavior, and he still appeared to be somewhat disorganized and vague in his explanations. The variable Academic Interactions was not a measure of quality of teaching; it was merely the ratio of academic interactions to all interactions (expressed as a percent).

The research by Stallings et al. (1978), indicated that providing high levels of teacher-led (or teacher-monitored) student involvement in academic tasks was an effective strategy for increasing reading scores. That study and other teacher effectiveness studies, however, go beyond the quantity of academic time to the quality of instruction. Certain sequences of activities seem to be more effective than others; clarity in explanations is critical, and so on. This teacher needed to improve in both the quantitative and qualitative aspects of academic instruction. The observers' low ratings and the encouraging observational data combine to indicate that Teacher 62 made some improvements in the quantity, but probably not in the quality, of his academic instruction.

Teacher 33. Teacher 33 had taught junior high math for seven years. She was approximately 45 years old. The 24 students in her basic math class were sixth- and seventh-graders and most of them were below average in math

skills. Many of the students either did not speak English or spoke it poorly. This teacher provided some of her instruction in Spanish.

Teacher 33 was in School 3. She was in Training Group I and had her aide fill out the seating chart observation. Teacher 34 (a non-improver) recruited her, and she received one college credit for participating in the training.

Before the training, the students in this class spent large amounts of time off-task. There was no discipline system in place and the students were "very restless." During one observation, the teacher gave a five-minute disciplinary lecture. During teacher-led activities, there were many call-outs and interruptions by students. The transitions were slow and inefficient; the students did not listen to the directions, and the teacher had to repeat them several times. There were usually five or six activities each period. Forty-seven percent of the teacher-student interactions were about academics. Before the training, the observers rated this teacher as ineffective and as having poor classroom control.

After the training, the percent of academic interactions rose to 75. Interestingly, two of the observers' logs were favorable, whereas the third observer felt this teacher

had improved little. There were several activities, the class ran smoothly, and students were well-behaved during the first two observations. But, apparently, things fell apart during the third observation. One observer described the students as "on-task, but restless." Thus, this teacher got two "effective" ratings and one "ineffective" rating.

Teacher 33 felt she benefitted greatly from the workshops. She said that, as a result of the training, she now puts the agenda on the board; uses more positive, specific praise; and has extra activities planned for those students who finish early. She reported that the easiest practice was "behavior management--setting rules and making students responsible for their own behavior."

It is interesting to note that when this teacher was asked if she had had discipline problems in the fall, she said "No, no problems with discipline. I take care of it my own way." She said the biggest problem in the fall was the students' need to succeed and build self-confidence. The most helpful practice listed by Teacher 33 was "making transitions--taking less time--getting students on-task." The most difficult practice for her was getting started without wasting time. After training, this teacher's z-scores on Ease of Providing Academic Time and Importance of Providing Academic Time were .03 and .21, respectively.

She was fairly close to the average for all teachers in her perception of the ease and importance of providing academic time.

Teacher 33 had many favorable comments about the training. She said it enabled her to see herself "in another positive, constructive way." She appreciated the personal nature of the workshops. She noted that, in other workshops, they "just gave information in a large group, they didn't know me as a person." She noted that the profiles were helpful because "after a while, you get into a rut and don't know how you're doing."

Teacher 33 made one comment that raises an important issue about the reliability and validity of classroom observation data. When asked how she felt about the observations, she referred to herself as "a big showman," and said that "possibly I may have been playing to the observer." She added that she "tried to carry on the training even when the observer wasn't there, but you still have a tendency to perform well when someone's there watching." Our stance regarding this issue is this: If the observation data reflect the teachers' best effort, that is fine. Then, pre- and post-training comparisons are made between teachers' best efforts. In this case, we know that the teacher is capable of using the recommended practices. A problem may arise, however, when some teachers are

motivated to show the best performance, and others are not so inclined. Then the measures of teacher behavior would include error arising from the motivation factor. And then, between-teacher comparisons of "improvement" may not reflect "true" behavior change. Finally, with only three observation occasions, it is impossible to know whether the behaviors displayed were a permanent part of the teacher's repertoire. In this teacher's case, the level of Academic Interactions was much lower on the final observation day than it was on the other two post-training occasions. But it was still higher than it was on any of the three pre-training occasions. So, we have inferred that there was significant improvement in this teacher's classroom behavior.

In summary, this teacher was able to make significant improvements in her class. She attributed these changes to the specific feedback (computer profiles), personal attention, and clear information she received in the training.

Characteristics of Improvers. The teachers who made the greatest improvements were all above average on their post-training ratings of the Importance of Providing Academic Time. Thus, by the end of training, these teachers had become convinced that it was important to maximize their students' academic time. They had a "philosophical acceptance" of the recommended practices and worked to make their

teaching congruent with their new beliefs (Mohlman, et al., 1982). This willingness to change was apparent in the interviews. All the improving teachers listed several (four or more) things that they were doing differently in their classes as a result of the training.

Three of the teachers indicated that, as a result of the training, they had experienced a heightened sense of control over their teaching environments. Teacher 71 said she had found that she "really could do something" about the problems in her class. Teacher 33 said she had found a "new awareness" of her own competence. And Teacher 62 said he no longer felt powerless--he had become aware of his problems and had found ways to solve some of them. It seems that these teachers grew in their sense of self-efficacy--their confidence in their ability to deal effectively with their classroom problems. They all reported having felt dissatisfied with their teaching but not knowing what to do differently. They felt the training raised their awareness of where the problems were and gave them new ideas and techniques to solve them. After training, they all expressed a renewed confidence in their ability to diagnose and handle problems. Again, we are reminded of Good's (1981) suggestion that effective teachers expect their students to learn and believe they are capable of helping them learn.

Two of the teachers (Teachers 41 and 43) reported that some of their "problem students" had been transferred to other classes. Although the loss of those students may have contributed to improved classroom control, there are other plausible explanations for these teachers' impressive changes. Both described themselves as being interested in learning to do a better job of teaching. Both had participated in other inservice programs during the previous two years. Clearly, these two teachers were open to new ideas and were willing to try out new practices that might improve their teaching.